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ANTHRAX IN LIVESTOCK



how to fight it

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ANTHRAX IN LIVESTOCK

how to fight it

Anthrax is an infectious disease that may produce swift death, chronic illness, or localized infection in man and animals. Most cases occur in cattle, horses, mules, sheep, or goats. Dogs, cats, wild animals of prey, and hogs occasionally become infected; poultry rarely does.

Because anthrax develops rapidly and because some animals are found dead, outbreaks often have caused hysteria and led to frantic selling of livestock. However, anthrax need not cause panic; today, the disease can be effectively controlled or—in many instances—prevented.

Each State has a disease-control program for anthrax; regulatory measures include use of vaccines and quarantines to stop the spread of disease. Federal veterinarians cooperate with State officials in carrying out control programs.

Cause

A microscopic organism, *Bacillus anthracis*, causes anthrax.

The active form is called a bacillus. It multiplies in the bloodstream of a susceptible animal—or in man—and produces blood poisoning.

The bacillus survives for only a short time outside the body. It is easily killed by heat, sunlight, drying, and disinfectants.

When exposed to air, it usually changes to a more resistant, or spore, form. The spore—a kind of protec-

tive capsule—can survive many years in soil, in animal products stored under dry conditions, or in a laboratory. Prolonged heat and strong lye solutions will kill it.

When a spore is eaten or taken into an animal's body, it changes back into a bacillus that can produce anthrax.

Where It Occurs

Most outbreaks are associated with "anthrax districts" or "anthrax incubation areas." These are created when organisms become established in soil. Alkaline soils are particularly suitable to survival and growth of anthrax spores.

The map (p. 3) shows recognized anthrax districts in the United States. Other States have small areas in which anthrax occurs.

Anthrax is practically unknown on well-drained, first-class farm lands.

How It Develops

For anthrax to develop, the organism must get into the animal's body.

Normally, infection is through spores that have begun to grow. Animals pick up and swallow spores by grazing contaminated pastures or eating contaminated hay, silage, and other feed. Infection is also possible through inhalation, skin abrasions, and insect bites.

Environment plays a major part in the development of anthrax. The disease follows the movement of infected animals and their hair, body discharges, wool, bones, or hides. Animal byproducts — raw bone-meal, meatscraps, and bristles—may contain spores.

Carcasses of animals that die of anthrax are especially dangerous. Dogs, swine, and wild animals of prey may become infected by contact with such carcasses. Horses and cattle may get anthrax from chewing on contaminated bones while trying to get phosphorus and other minerals.

There is no field evidence to show that insects or birds can spread anthrax from farm to farm.

Outbreaks

In the United States, most anthrax occurs on pasture under the following conditions:

1. Spores have become established in the soil. Spores may be from old or new outbreaks, improv-

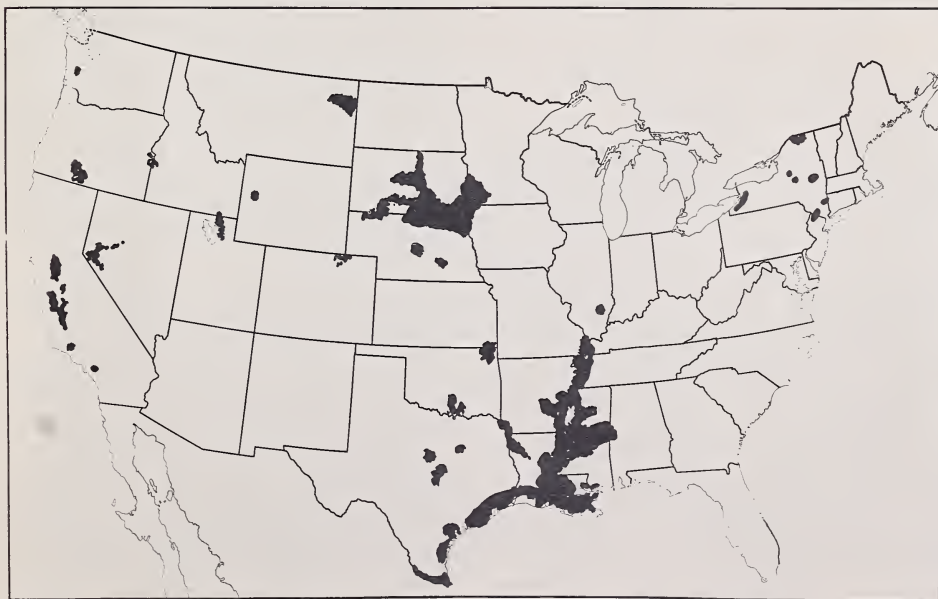
erly handled carcasses, or infected animals trailed over the area.

2. Soil is alkaline. Favorable areas include limestone soils, alluvial flats, bottomlands, meadow-marshes, and dried-up ponds as well as buffalo wallows and slick spots where water has been trapped on high ground.

3. "Anthrax weather" occurs. Heavy rain or floods in spring are followed by a hot, dry period in summer. Minimum temperatures are above 60° F.—high enough for spores to begin to grow.

4. Grass or vegetation is damaged by flood-drought sequence. Just before the outbreak, pasture grass or limestone rock that has been slick with vegetation dries up and anthrax spores are exposed. Grass turns a characteristic brown, not black and decomposed like plants that die under water.

The usual anthrax season is late summer or fall. Susceptible animals that graze or are bedded on contaminated pastures at that time may develop the disease.



Anthrax districts in the United States.



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Typical western anthrax district. Unvaccinated animals grazing on spore-laden, water-damaged grass developed anthrax.

“Off-season” anthrax may occur if animals get contaminated feed or come in contact with spores in by-products or carcasses.

In many anthrax districts, several years may pass without an outbreak. But—once the organism gets in suitable soil—the disease will reappear whenever conditions again become favorable.

Signs of Anthrax

Generalized anthrax

Generalized anthrax—the most common form—affects cattle, horses, mules, sheep, and goats. It is known as acute or subacute, depending upon the length of time the animal is visibly sick. Usually generalized anthrax is fatal within 1 to 2 days, but it may continue for 5 days. Few infected animals recover without treatment.

Occasionally, a seemingly healthy animal suddenly staggers, has convulsions, and dies. More often, infected animals die without showing signs of disease.

Bloody discharges may pass from the mouth, the nose, and the anus. Other indications of generalized

anthrax are high temperature, excitement followed by depression, stupor, chills, muscular weakness, and colic or respiratory difficulties. Pregnant cows may abort; milk production of infected cows may drop sharply.

Localized anthrax

Cases of localized anthrax often accompany an outbreak of generalized anthrax. Usually, infection is confined to a specific site—a muscle, a patch of skin, the throat, the tongue, or other small area. This form of anthrax seldom causes death unless the infection spreads to vital organs.

If animals with localized anthrax receive treatment, they usually recover gradually.

Localized anthrax occurs most often in hogs, but cattle, horses, mules, and dogs also may develop it. Affected animals may become visibly sick. In hogs, marked swellings of the throat and tongue frequently are accompanied by blood-stained, frothy discharges from the mouth. Throat swellings may cause suffocation.

In cattle, swellings are most common along the brisket and belly; in horses and mules, throat and shoulder areas are frequently affected. Swellings heal slowly. Cattle, horses, and mules with localized anthrax may lose condition gradually, although they may not develop other symptoms.

Animals may develop a localized skin infection—or cutaneous anthrax—when organisms lodge in an open wound or skin abrasion. **It is this form of anthrax that humans sometimes get when they handle diseased animals or carcasses without taking proper sanitary precautions.**

Appearance of dead animal

After an animal dies of anthrax, dark “tarry” blood usually oozes from natural body openings. The carcass becomes abnormally bloated and decomposes rapidly, but normal rigor mortis does not occur.

Hemorrhages beneath the skin are common. Gelatinous discharges—clear or blood-tinged—come from body swellings and insect bites.

Generalized anthrax may be confused with lightning stroke, sunstroke, lead poisoning, blackleg, malignant edema, and other conditions that cause sudden death.

Precautions

Do not open the carcass of any animal that has died of anthrax, that is a suspected victim of anthrax, or that died suddenly of no apparent cause. Call a veterinarian to examine the carcass and to make a diagnosis. Opening carcasses without taking proper precautions often causes anthrax in humans and leads to further outbreaks.

Observe the following precautions if anthrax has been diagnosed, or if the reason for the animal's death is undetermined—

- Saturate the carcass with waste oil or kerosene before burning or burial. This will keep other animals and insects from feeding on it.
- Do not skin the carcass.
- Do not feed the carcass to other farm animals.
- Do not take the carcass to a rendering plant.



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Eastern meadow-marsh. Cattle that graze this area are vaccinated annually to prevent anthrax outbreaks.

Vaccination

Vaccines protect animals against anthrax. In an outbreak, vaccines help control the disease.

In the United States, a noncapsulated vaccine is widely used against anthrax. Vaccination provides protection 8 days after it is given.

Ask your veterinarian about the need for vaccination in your area. If desirable, he will vaccinate animals.

Generally, vaccines are used only when a threat of anthrax exists. In anthrax districts, cattle, horses, mules, sheep, and goats are vaccinated each year. Occasionally, hogs are vaccinated. Vaccines are administered 4 to 6 weeks before the beginning of the anthrax season; in districts with long anthrax seasons, animals are given booster shots after 4 to 6 months.

In areas where anthrax is not a yearly problem, most veterinarians recommend vaccination only when outbreaks occur.

As soon as anthrax is confirmed, move unvaccinated animals off contaminated pastures or premises and have them vaccinated at once.

Diagnosis

When an animal dies suddenly of no apparent cause or when you have reason to suspect anthrax, immediately notify your own veterinarian or your State disease control officials. The veterinarian who examines the suspected anthrax-infected carcass will obtain materials needed for laboratory tests. Such tests are the only accurate way to diagnose anthrax.

Treatment

Early treatment of infected animals will increase their chances for recovery. When an outbreak occurs, check all livestock frequently. Isolate affected animals; begin treatment at once.

Consult a veterinarian about using antibiotics or anti-anthrax



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Heifer with localized anthrax. Swelling beneath belly is typical of this form of anthrax. The animal recovered.

serum. These are effective in treating animals in early stages of anthrax. Treatment of animals in advanced stages is less successful.

Control

When anthrax is diagnosed as the cause of an animal's death, the State disease control agency starts its anthrax program. Although programs vary, each State begins with a search for the cause and source of the outbreak. At the same time, each program is designed to—

- Stop the spread of anthrax as swiftly as possible.
- Reduce livestock losses.
- Prevent soil contamination that might lead to future outbreaks.

Cooperation of livestock producers in the affected district is needed to make the anthrax control program successful.

Measures to control anthrax outbreaks include—

- Quarantines of contaminated premises or areas. State officials may quarantine affected farms, ranches, or districts until anthrax no longer is a problem.
- Prompt disposal of dead animals.
- Careful examination of all livestock on the affected farm or ranch, with isolation and prompt treatment of visibly sick animals.
- Vaccination of exposed animals not previously vaccinated.
- Destruction of manure, bedding, and other contaminated materials.
- Cleaning and disinfection of contaminated buildings in which animals have died of anthrax.
- Change of pastures, if practical.
- Control of flies that might spread anthrax organisms to other animals within the herd and to man.

Disposal of carcasses

As soon as the diagnosis is confirmed, carcasses of animals that have died of anthrax should be disposed of by complete burning or deep burial.

Burn or bury the carcass where it is found. In unusual circumstances when the carcass must be moved, handle it with materials that can be burned or disinfected and move it on a vehicle that can be disinfected with lye. Do not drag the carcass or allow it to contaminate the soil over which it moves.

First saturate the carcass with oil or kerosene. Then sear the area around the carcass. Begin burning at both the head and rear quarters so that heat can dry fluids in the digestive tract. Make sure all bits of bone, teeth, and hoof are completely burned.

Do not bury carcasses unless burning is impractical, or there are many animals to be disposed of. Bury every carcass under at least 6 feet of soil. Then saturate the area with oil and burn it over.

Contaminated materials

Carefully remove manure, bedding, and other contaminated materials from buildings and runways used by infected animals. Burn contaminated feed, bedding, and manure with the animal's carcass or burn them separately.

Cleaning and disinfection

If an animal dies of anthrax inside a barn or other building, the building must be thoroughly cleaned and disinfected. Cleaning and disinfection should kill all anthrax bacilli and spores; contamination that survives can trigger later outbreaks.

Use a solution containing 5 percent of lye for disinfection. To make the solution, dissolve $2\frac{1}{2}$

pounds of lye in 5½ gallons of water. Apply it immediately.

Caution: Lye is a caustic poison. Use extreme care in handling it.

Thoroughly soak all walls, partitions, ceilings, and floors of cleaned buildings with the lye solution. Let it remain at least 24 hours; then rinse the interior with water before rehousing livestock.

Disinfect equipment used in handling the carcass by soaking in or by saturating with the lye solution.

If trucks or other vehicles are used to transport infected or exposed animals, disinfect beds and other contaminated areas with the lye solution. Leave the solution on vehicles 8 hours; then wash it off.

Anthrax in Man

In man, anthrax may occur as a localized infection or as a generalized infection.

Usually, man gets anthrax by handling a diseased carcass or contaminated wool, hair, hides, or animal byproducts. Most cases occur among farmers, ranchers, veterinarians, and packinghouse workers—who handle carcasses or products from animals that have died of anthrax—and among industrial workers—who process contaminated wool, hides, and hair.

Anthrax of the skin is the most common form in man. This form

usually produces a localized infection, which may develop into a generalized infection.

Workers who handle diseased animals may become infected if anthrax organisms lodge in an open wound or skin abrasion on their hands, arms, faces, or other exposed areas. Anthrax of the skin has been reported following bites of insects that carry spores. The first symptom of infection is a small pimple, which enlarges painlessly. Later, a black center develops.

After you have handled products that could have been contaminated with anthrax spores, examine your hands, arms, and face often. **Consult a physician at once if a pimple develops and begins to enlarge.** A physician can successfully cure anthrax of the skin when treatment with antibiotics is begun early. Fatal blood infection may result if the disease is not treated.

Inhalation anthrax, or woolsorters' disease, produces a generalized infection that often is fatal. This form develops after workers inhale spores during the processing of contaminated wool, hair, or hides. A vaccine is available to protect humans who are frequently exposed.

Generalized anthrax may develop after man eats meat containing anthrax organisms; it usually is fatal. This form has not been reported in the United States.

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For additional copies, send a post card requesting PA-431, "Anthrax in Livestock: How To Control It," to the Office of Information, U.S. Department of Agriculture, Washington, D.C. 20250. Include your name, address, and ZIP code.